Appl. No. 09/176,639
Amdt. Dated March 14, 2006
Reply to Office action of December 14, 2005

Claim Amendments:

1-23, 25-51 (cancelled)

24. (currently amended): ~~The touch pad system of claim 16,~~ A touch pad system comprising:

a sensor layer;

an insulative layer disposed over said sensor layer; and

a touch layer disposed over said insulative layer, said touch layer having a conductivity selected to create an image of a conductive object that is larger than an area of contact of said conductive object, and wherein said sensor layer capacitively detects the image of said conductive object when a user places a conductive object proximate said touch layer, wherein the conductivity of said touch layer is configured to limit the size of said to approximately four times the area of contact of said conductive object.

52. (previously presented): A capacitive touch pad system comprising:

a sensor layer;

an insulative layer disposed over said sensor layer; and

a conductive touch layer disposed over said insulative layer, wherein said sensor layer, said insulative layer and said conductive touch layer are configured to form a capacitor with a conductive object when a user places said conductive object proximate said sensor layer, said formed capacitor having a capacitance determined in part by the conductive touch layer and the conductive object, and wherein the conductive touch layer has a conductivity configured to create an image of said conductive object that is larger than an area of contact of said conductive object to thereby increase the capacitance of the formed capacitor when contacting the conductive touch layer and facilitate sensing of the capacitance to determine a position of the conductive object.

PAGE 3/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

53 (previously presented): The touch pad system of claim 52, wherein said image of said conductive object is about the size of a finger when said area of contact is defined by a conductive stylus tip.

54 (previously presented): The touch pad system of claim 52, wherein said conductive touch layer comprises a conductive material disposed in a plastic carrier.

55 (previously presented): The touch pad system of claim 54, wherein said conductive material comprises carbon powder.

56 (previously presented): The touch pad system of claim 52, wherein said insulative layer, said conductive touch layer and said sensor layer are transparent, and wherein a display is positioned beneath said sensor layer and images from the display are viewable through said sensor layer, said insulative layer and said conductive touch layer, said display configured to provide visual feedback to a user of the touch pad system.

57 (previously presented): The touch pad system of claim 52, further comprising:

a bezel disposed over said conductive touch layer and covering a perimeter of said conductive touch layer, wherein said bezel is configured to limit edge distortion effects by preventing the conductive object from contacting the conductive touch layer at the perimeter.

58 (previously presented): The touch pad system of claim 52, wherein the touch pad system is configured to compensate for edge distortion by use of a correction function applied to measured conductive object positions during operation of the touch pad system.

PAGE 4/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

59 (previously presented): The touch pad system of claim 58 wherein the correction function is generated by measurement of conductive object positions at multiple locations on said conductive touch layer, tabulation of said measurements of said conductive object positions, and development of a mathematical function from said tabulation.

60 (previously presented): The touch pad system of claim 52, wherein the touch pad system is configured to distinguish an identity of the conductive object by determining a change in the capacitance over a selected time period when the conductive objective is positioned proximate the conductive touch layer, wherein the a variable change in capacitance over the selected time period corresponds to a finger determination and a substantially constant capacitance over the selected time period corresponds to a stylus determination.

61 (previously presented): The touch pad system of claim 52 wherein the conductive touch layer is configured to produce a visual mark of the conductive object contacting said conductive touch surface.

62 (previously presented): The touch pad system of claim 52 wherein the conductive touch layer has the conductivity selected such that the image has an area at least four times larger than the area of contact of said conductive object.

PAGE 5/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

63. (previously presented): A capacitive touch pad system comprising:

a sensor layer;

an insulative layer disposed over said sensor layer; and

a conductive touch layer disposed over said insulative layer, wherein said sensor layer, said insulative layer and said conductive touch layer are configured to form a capacitor with a conductive object when a user places said conductive object proximate said sensor layer, said formed capacitor having a capacitance determined in part by the conductive touch layer and the conductive object, and wherein the conductive touch layer comprises conductive carbon disposed in epoxy and has a conductivity selected to create an image of said conductive object that is at least four times larger than an area of contact of said conductive object to thereby increase the capacitance of the formed capacitor when contacting said conductive touch layer and facilitate sensing of the capacitance to determine a position of the conductive object.

64 (new): The touch pad system of claim 52, wherein the touch pad system further comprises a means of distinguishing an identity of the conductive object.

65. (new): The touch pad system of claim 64 wherein said means for distinguishing said identity of said conductive object comprises a means using a size of said image.

66. (new): The touch pad system of claim 64 wherein said means for distinguishing said identity of said conductive object determines a change in the capacitance over a selected time period when the conductive objective is positioned proximate the conductive touch layer, wherein the a variable change in capacitance over the selected time period corresponds to a finger determination and a substantially constant capacitance over the selected time period corresponds to a stylus determination.

PAGE 6/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

67. (new): The touch pad system of claim 64 wherein said means for distinguishing said identity of said conductive object comprises a means based on a rate of change of a detected change in capacitance, wherein a stylus produces an immediate full strength detected change in capacitance upon contact with said conductive touch layer and a finger produces a gradually increasing detected change in capacitance as said finger approaches contacting said conductive touch layer.

68. (new): A capacitive touch pad system comprising:

a sensor layer;

an insulative layer disposed over said sensor layer; and

a conductive touch layer disposed over said insulative layer, wherein said sensor layer, said insulative layer and said conductive touch layer are configured to create a detectable capacitance change when a user places said conductive object proximate said sensor layer, said detectable capacitance change determined in part by said conductive touch layer and the conductive object, and wherein the conductive touch layer has a conductivity configured to create an image of said conductive object that is larger than an area of contact of said conductive object with said conductive touch layer to thereby increase said detectable capacitance change when said conductive object is contacting said conductive touch layer.

69. (new): The capacitive touch pad system of claim 68 wherein said image of said conductive object forms a larger effective capacitive plate for coupling to said sensor layer.

70. (new): The capacitive touch pad system of claim 68, wherein said image of said conductive object is about a size of a finger contact area when said area of contact with said conductive touch layer is defined by a tip on a conductive fine-tipped stylus.

PAGE 7/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

71. (new): The capacitive touch pad system of claim 68, wherein the conductivity of said conductive touch layer is configured to limit a size of said image to approximately four times the area of contact of said conductive object.

72. (new): The capacitive touch pad system of claim 68, wherein said conductive touch layer is formed with a conductive material disposed in a plastic carrier.

73. (new): The capacitive touch pad system of claim 72, wherein said conductive material comprises carbon powder.

74. (new): The capacitive touch pad system of claim 68, wherein said insulative layer, said touch layer and said sensor layer are at least partially transparent.

75. (new): The capacitive touch pad system of claim 74, further comprising:

a display in operative communication below said sensor layer, said display configured to be viewable through said sensor layer, said insulative layer, and said conductive touch layer.

76. (new): The capacitive touch pad system of claim 75, wherein said display is configured to provide visual feedback to said user of said capacitive touch pad system.

77. (new): The capacitive touch pad system of claim 68, wherein said conductive object comprises a conductive stylus holdable by said user such that said user is in electrical communication with said stylus.

78. (new): The capacitive touch pad system of claim 68, wherein said conductive object comprises one of a metal and a conductive plastic.

PAGE 8/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

79. (new): The capacitive touch pad system of claim 68, wherein said conductive object includes a conductive tip, said conductive tip selected from the group consisting of a wide stylus, a ball of conductive foam, and a circular metal plate with a ball joint.

80. (new): The capacitive touch pad system of claim 68, wherein said conductive object comprises a fine tipped conductive pen.

81. (new): The capacitive touch pad system of claim 68, further comprising:

a bezel disposed over said conductive touch layer and covering a perimeter of said conductive touch layer, wherein said bezel is configured to limit edge distortion effects by preventing said conductive object from contacting said conductive touch layer at said perimeter.

82. (new): The capacitive touch pad system of claim 68, wherein said capacitive touch pad system is is configured to compensate for edge distortion by use of a correction function applied to measured conductive object positions during operation of said capacitive touch pad system.

PAGE 9/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

83. (new): The capacitive touch pad system of claim 68, wherein said calibration means comprises:

a correction function configured to compensate for edge distortion, wherein said correction function can be applied to measured conductive object positions during operation of the capacitive touch pad system.

84. (new): The capacitive touch pad system of claim 68, wherein said capacitive touch pad system further comprises a means for distinguishing an identity of said object.

85. (new): The capacitive touch pad system of claim 84, wherein said means for distinguishing an identity of said object comprises a means using a size of said image.

86. (new) The capacitive touch pad system of claim 84 wherein said means for distinguishing said identity of said conductive object is configured to distinguish said identity of said conductive object by determining a change in said capacitance over a selected time period when said conductive objective is positioned proximate the conductive touch layer, wherein the a variable change in capacitance over the selected time period corresponds to a finger determination and a substantially constant capacitance over the selected time period corresponds to a stylus determination.

87. (new) The capacitive touch pad system of claim 84 wherein said means for distinguishing said identity of said conductive object comprises a means based on a rate of change of a detected change in capacitance, wherein a stylus produces an immediate full strength detected change in capacitance upon contact with said conductive touch layer and a finger produces a gradually increasing detected change in capacitance as said finger approaches contacting said conductive touch layer.

PAGE 10/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

88. (new): A capacitive touch pad system comprising:

a sensor layer;

an insulative layer disposed over said sensor layer; and

a conductive touch layer disposed over said insulative layer, wherein said sensor layer, said insulative layer and said conductive touch layer are configured to create a detectable capacitance change when a user places said conductive object proximate said sensor layer, said detectable capacitance change determined in part by said conductive touch layer and said conductive object, and wherein said conductive touch layer has a conductivity configured to create an image of said conductive object that is larger than an area of contact of said conductive object to thereby increase said detectable capacitance change when said conductive object is contacting said conductive touch layer and facilitate sensing of said detectable capacitance change to determine a position of said conductive object, and wherein said conductive touch layer is configured to produce a visual mark representative of said area of contact for providing visual feedback to the user.

89. (new): The capacitive touch pad system of claim 88 wherein said visual mark is produced by a mechanical contact of said conductive object with said conductive touch layer.

90. (new): The capacitive touch pad system of claim 88 wherein said visual mark is produced by a chemical property of said conductive object.

91. (new): The capacitive touch pad system of claim 89 wherein said visual mark is an alteration in at least one of a color and a reflectivity produced by said mechanical contact of said conductive object with said conductive touch layer.

92. (new): The capacitive touch pad system of claim 89 wherein said visual mark is produced by a sacrificial material on a tip of said conductive object.

PAGE 11/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006

93. (new): The capacitive touch pad system of claim 92 wherein said sacrificial material comprises graphite.

94. (new): The capacitive touch pad system of claim 89 wherein said conductive touch layer comprises a pliant material, and wherein visual mark is produced by a groove in said conductive touch layer in response to mechanical contact of said conductive object with said conductive touch layer.

95. (new): The capacitive touch pad system of claim 89 wherein said visual mark produced by said mechanical contact of said conductive object with said conductive touch layer is removable.

96. (new): The capacitive touch pad system of claim 88 wherein said visual mark is produced by a layer of liquid crystal material coupled to said conductive touch layer in response to mechanical contact of said conductive object with said conductive touch layer.

PAGE 12/19 * RCVD AT 3/14/2006 11:46:24 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/3 * DNIS:2738300 * CSID:4803855061 * DURATION (mm-ss):05-30

Copied from 10176639 on 03/20/2006